Opto-Isolation Digital Output for PCI Express
(On-board Power Supply)

DO-32B-PE



This product is a PCI Express bus-compliant interface board used to provide a digital signal I/O function on a PC. This product can input and output digital signals at 12 - 24VDC. DO-32B-PE features 32 opto-coupler isolated open-collector outputs. Equipped with power for opto-coupler operation (12VDC) supplied and output transistor protection circuit (surge voltage protection and over current protection).
Windows/Linux driver is bundled with this product.
Possible to be used as a data recording device for LabVIEW, with dedicated libraries.

* Specifications, color and design of the products are subject to change without notice.

Features

Opto-coupler isolated open-collector output (current sink type)

DO-32B-PE has the opto-coupler isolated open-collector output 16channels (current sink type) whose response speed is 200µsec. Common terminal provided per 16channels, capable of supporting a different external power supply. Supporting driver voltages of 12 - 24 VDC for I/O.

Opto-coupler bus isolation

As the PC is isolated from the input and output interfaces by opto-couplers, this product has excellent noise performance.

Power for opto-coupler operation (12VDC 240mA) supplied internally

As the power to run the opto-couplers is supplied internally, no external power supply is required. The use of jumpers allows you to decide whether you want to use the internal or external power supply for every 16 points.

Windows/Linux compatible driver libraries are attached.

Using the attached driver library API-PAC(W32) makes it possible to create applications of Windows/Linux. In addition, a diagnostic program by which the operations of hardware can be checked is provided.

Output circuits include zener diodes for surge voltage protection and poly-switches for overcurrent protection.

Zener diodes are connected to the output circuits to protect against surge voltages. Similarly, polyswitches are fitted to each group of 8channels outputs for over-current protection. The output rating is max. 35VDC, 100mA per channel.

Functions and connectors are compatible with PCI compatible board PO-32B(PCI)H.

The functions same with PCI compatible board PO-32B(PCI)H are provided.
In addition, as there is compatibility in terms of connector shape and pin assignments, it is easy to migrate from the existing system.

LabVIEW is supported by a plug-in of dedicated library VI-DAQ.

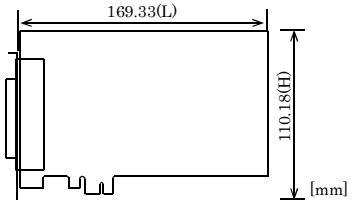
Using the dedicated library VI-DAQ makes it possible to make a LabVIEW application.

Specification

Item		Specification
Output		
Output format		Opto-coupler isolated open collector output (current sink type) (Negative logic *1)
Number of output signal channels		32channels (1 common per 16channels)
Output rating	Output voltage	35VDC (Max.)
	Output current	100mA (par channel) (Max.)
Residual voltage with output on		0.5V or less (Output current≤50mA), 1.0V or less (Output current≤100mA)
Surge protector		Zener diode RD47FM(NEC) or equivalent to it
Response time		Within 200μsec
Common		
Built-in power		12VDC 240mA *2
Allowable distance of signal extension		Approx. 50m (depending on wiring environment)
I/O address		Any 32-byte boundary
Interruption level		1 level use
Max. board count for connection		16 boards including the master board
Isolated Power		500Vrms
External circuit power supply		12 - 24VDC(±10%)
Power consumption (Max.)		When using the internal power supply : 3.3VDC 380mA, 12VDC 350mA When using the external power supply : 3.3VDC 380mA
Operating condition		0 - 50°C, 10 - 90%RH (No condensation)
Bus specification		PCI Express Base Specification Rev. 1.0a x1
Dimension (mm)		169.33(L) x 110.18(H)
Connector		37 pin D-SUB connector [F (female) type] DCLC-J37SAF-20L9E [mfd. by JAE] equivalent to it
Weight		140g

*1 Data "0" and "1" correspond to the High and Low levels, respectively.
*2 When using the internal power supply, the SW section of output channel consumes up to 30mA, so the output current that can be supplied to the external device is 180mA.

Board Dimensions



The standard outside dimension (L) is the distance from the end of the board to the outer surface of the slot cover.

Support Software

Windows version of digital I/O driver

API-DIO(WDM) / API-DIO(98/PC)

[Stored on the bundled CD-ROM driver library API-PAC(W32)]

The API-DIO(WDM) / API-DIO(98/PC) is the Windows version driver library software that provides products in the form of Win32 API functions (DLL). Various sample programs such as Visual Basic and Visual C++, etc and diagnostic program useful for checking operation is provided.

< Operating environment >

OS	Windows Vista, Windows XP, Server 2003, 2000
Adaptation language	Visual Basic, Visual C++, Visual C#, Delphi, C++ Builder

You can download the updated version from the CONTEC's Web site (http://www.contec.com/apipac/). For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

Linux version of digital I/O driver

API-DIO(LNX)

[Stored on the bundled CD-ROM driver library API-PAC(W32)]

The API-DIO(LNX) is the Linux version driver software which provides device drivers (modules) by shared library and kernel version. Various sample programs of gcc are provided.

< Operating environment >

OS	RedHatLinux, TurboLinux (For details on supported distributions, refer to Help available after installation.)
Adaptation language	gcc

You can download the updated version from the CONTEC's Web site (http://www.contec.com/apipac/). For more details on the supported OS, applicable language and new information, please visit the CONTEC's Web site.

Data acquisition VI library for LabVIEW

VI-DAQ (Available for downloading (free of charge) from the CONTEC web site.)

This is a VI library to use in National Instruments LabVIEW. VI-DAQ is created with a function form similar to that of LabVIEW's Data Acquisition VI, allowing you to use various devices without complicated settings.
See http://www.contec.com/vidaq/ for details and download of VI-DAQ.

Cable & Connector

Cable(Option)

Flat Cable with Two 37-pin D- SUB Connectors
: PCB37P-1.5 (1.5m)
: PCB37P-3 (3m)
: PCB37P-5 (5m)

Shielded Cable with Two 37-pin D- SUB Connectors
: PCB37PS-0.5P (0.5m)
: PCB37PS-1.5P (1.5m)
: PCB37PS-3P (3m)
: PCB37PS-5P (5m)

Flat Cable with One 37-pin D- SUB Connector
: PCA37P-1.5 (1.5m)
: PCA37P-3 (3m)
: PCA37P-5 (5m)

Shielded Cable with One 37-pin D- SUB Connector
: PCA37PS-0.5P (0.5m)
: PCA37PS-1.5P (1.5m)
: PCA37PS-3P (3m)
: PCA37PS-5P (5m)

Connector(Option)

37-pin D-SUB Male Connector Set (5 Pieces)
: CN5-D37M

Accessories

Accessories (Option)

Screw Terminal (M3 x 37P)	: EPD-37A *1*2
Screw Terminal (M3.5 x 37P)	: EPD-37 *1
General Purpose Terminal	: DTP-3A *1
Screw Terminal	: DTP-4A *1
Signal Monitor for Digital I/O	: CM-32(PC)E *1

*1 A PCB37P or PCB37PS optional cable is required separately.
*2 "Spring-up" type terminal is used to prevent terminal screws from falling off.

* Check the CONTEC's Web site for more information on these options.

Packing List

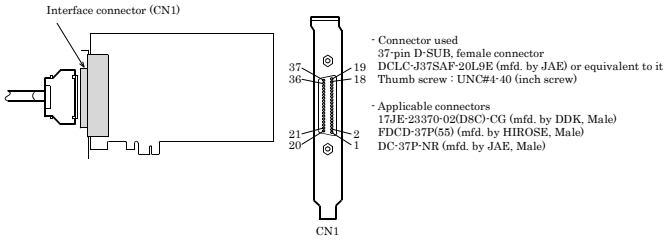
- Board [DO-32B-PE] …1
- First step guide … 1
- CD-ROM *1 [API-PAC(W32)] …1

*1 The CD-ROM contains the driver software and User's Guide.

How to connect the connectors

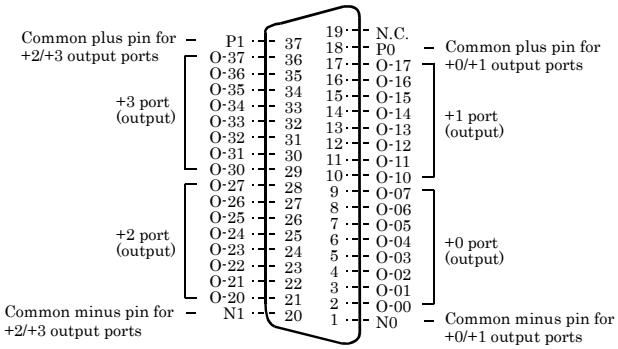
Connector Shape

The on-board interface connector (CN1) is used when connecting this product and the external devices.



Connector Pin Assignment

< Pin Assignments of Interface Connector (CN1) >



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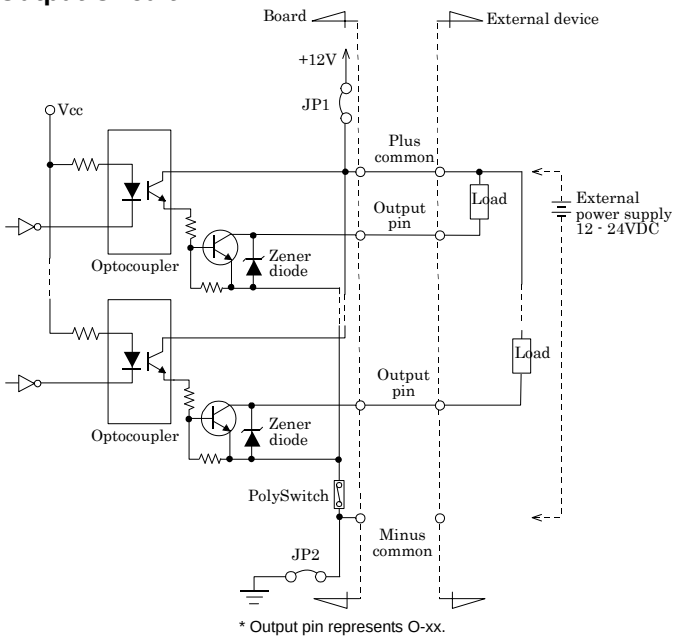
* The numbers in square brackets [ ] are pin numbers designated by HONDA TSUSHIN KOGYO CO., LTD.

O-00 - O-37	32 output signal pins. Connect these pins to the input signal pins of the external device.
P0	When the external power supply is selected, its positive side is connected to these pins. When the internal power supply is used, these pins output power at +12 V. These pins are common to 16 output signal pins.
P1	When the external power supply is selected, its negative side is connected to this pin. When the internal power supply is selected, this pin serves as the ground. These pins are common to 16 output signal pins.
N0	When the external power supply is selected, its positive side is connected to these pins. When the internal power supply is used, these pins output power at +12 V. These pins are common to 16 output signal pins.
N1	When the external power supply is selected, its negative side is connected to this pin. When the internal power supply is selected, this pin serves as the ground. These pins are common to 16 output signal pins.
N.C.	This pin is left unconnected.

Connecting Output Signals

Connect the output signals to a current-driven controlled device such as a relay or LED.
The board controls turning ON/OFF the current-driven controlled device using a digital value.

Output Circuit

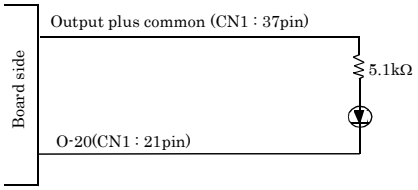


* Output pin represents O-xx.

The output circuits of interface blocks of the DIO-1616B-PE and DO-32B-PE are illustrated above. The signal output section is an opto-coupler isolated, open-collector output (current sink type). This product therefore requires the on-board internal power supply or the external power supply to drive the output section of this product.
The rated output current per channel is 100 mA at maximum. The output section can also be connected to a TTL level input as it uses a low-saturated transistor for output. The residual voltage (low-level voltage) between the collector and emitter with the output on is 0.5 V or less at an output current within 50 mA or at most 1.0 V at an output current within 100 mA.
A zener diode is connected to the output transistor for protection from surge voltages.
A PolySwitch-based overcurrent protector is provided for every 8 output transistors.
When the overcurrent protector works, the output section of this product is temporarily disabled. If this is the case, turn of the power to the PC and the external power supply and wait for a few minutes, then turn them on back.

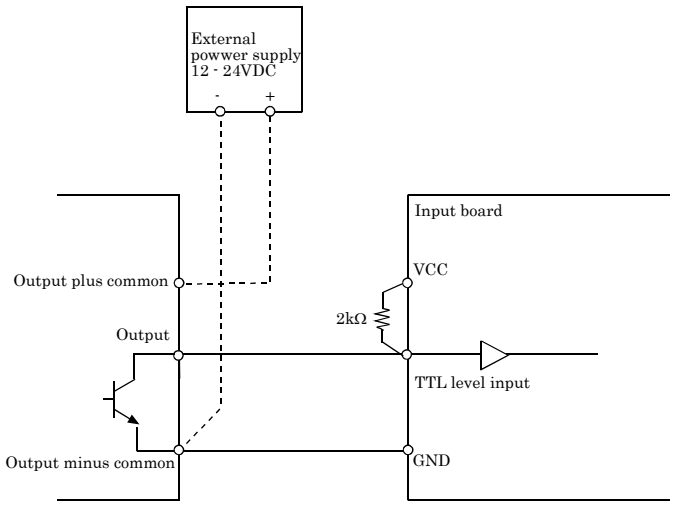
⚠ CAUTION
When the PC is turned on, all output are reset to OFF.
Please refer to “Selecting Power Supply” and then connecto the jumper in accordance with the power supply to be used

- Connection to the LED



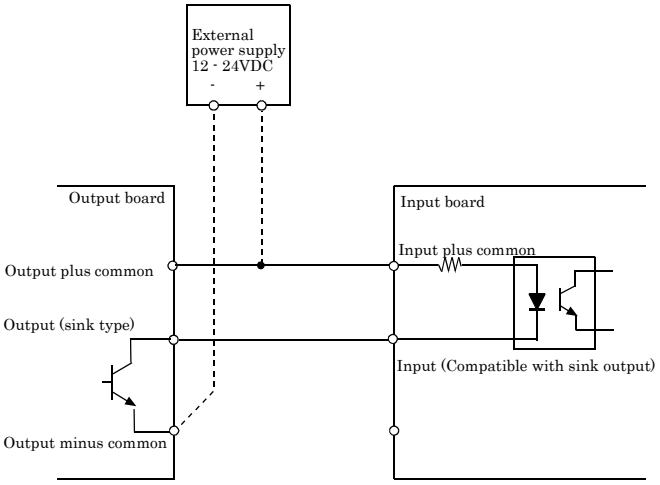
When “1” is output to a relevant bit, the corresponding LED comes on.
When “0” is output to the bit, in contrast, the LED goes out.

Example of Connection to TTL Level Input



Connecting the Sink Type Output and Sink Output Support Input

The following example shows a connection between a sink type output (output board) and a sink output support input (input board). Refer to this connection example when you connect such boards to each other.



Block Diagram

